Avaya Solution & Interoperability Test Lab

Application Note for Configuring the Ascom Wireless IP-DECT SIP Solution with an Avaya Aura™ Telephony Infrastructure in a Converged Voice over IP and Data Network - Issue 1.0

Abstract

These Application Notes describe a solution for supporting wireless interoperability between the Ascom wireless IP-DECT SIP solution with an Avaya Aura™ Telephony Infrastructure consisting of Avaya Aura™ Communication Manager, Avaya Aura™ SIP Enablement Services, Avaya Modular Messaging and Avaya Communication Manager Messaging in a converged Voice over IP and Data Network. Emphasis of the testing was placed on verifying good voice quality of calls with Ascom wireless IP-DECT SIP handsets registered to the Avaya telephony infrastructure.

Information in these Application Notes has been obtained through DevConnect compliance testing and additional technical discussions. Testing was conducted via the DevConnect Program at the Avaya Solution and Interoperability Test Lab.

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1. Introduction

These Application Notes describe the configuration process necessary to provide interoperability between the Ascom wireless IP Digital Enhanced Cordless Telecommunications (IP-DECT) Solution with an Avaya Aura™ Telephony Infrastructure consisting of Avaya Aura™ Communication Manager, Avaya Aura™ SIP Enablement Services, Avaya Modular Messaging and Avaya Communication Manager Messaging.

1.1. Interoperability Compliance Testing

The compliance testing focused on verifying interoperability of the Ascom wireless IP-DECT SIP Solution comprised of the Ascom wireless IP-DECT Base Station and Ascom wireless DECT Handsets with an Avaya Aura™ Telephony Infrastructure consisting of Avaya Aura™ Communication Manager, Avaya Aura™ SIP Enablement Services, Avaya Modular Messaging and Avaya Communication Manager Messaging in a converged Voice over IP and Data Network. Additional testing verified proper operation with the Avaya 9630 IP Telephone (SIP), Avaya 9620 IP Telephone (H.323) and the Avaya 2420 Digital Telephone. Voicemail and MWI using Avaya Modular Messaging and Avaya Communication Manager Messaging was tested and verified to operate correctly.

Avaya's formal testing and Declaration of Conformity is provided only on the headsets/handsets that carry the Avaya brand or logo. Avaya may conduct testing of non-Avaya headsets/handsets to determine interoperability with Avaya telephones. However, Avaya does not conduct the testing of non-Avaya headsets/handsets for: Acoustic Pressure, Safety, Hearing Aid Compliance, EMC regulations, or any other tests to ensure conformity with safety, audio quality, long-term reliability, scalability or any regulation requirements. As a result, Avaya makes no representations whether a particular non-Avaya headset will work with Avaya's telephones or with a different generation of the same Avaya telephone.

Since there is no industry standard for handset interfaces, different manufacturers utilize different handset/headset interfaces with their telephones. Therefore, any claim made by a headset vendor that its product is compatible with Avaya telephones does not equate to a guarantee that the headset will provide adequate safety protection or audio quality.

1.2. Ascom IP-DECT Base Station

The Ascom IP-DECT system is a modular solution for large and small deployments with full handover capabilities with one PBX. The Ascom IP-DECT Base Station works as a conduit between the Avaya Aura™ SIP Enablement Services and the Ascom IP-DECT wireless handsets.

After the Ascom IP-DECT wireless handsets register with the Ascom IP-DECT Base Station, the Base Station registers the handsets to Avaya Aura™ SIP Enablement Services.

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1.3. Support

Technical support for the Ascom Wireless IP-DECT Handset can be obtained through local Ascom suppliers.

Ascom global technical support:
Phone: +46 31 559450
Email: support@ascom.se

2. Reference Configuration

The network diagram shown in **Figure 1** illustrates the testing environment used for compliance testing. The network consists of an Avaya Aura™ Communication Manager running on an Avaya S8300 Server with an Avaya G450 Media Gateway, and Avaya S8500 server running Avaya Aura™ SIP Enablement Services, one Avaya Modular Messaging Application Server, one Avaya Modular Messaging Storage Server, one Avaya 9630 IP Telephone (SIP), one Avaya 9620 IP Telephone (H.323), one Avaya 2420 Digital Telephone, two Ascom Wireless IP-DECT Base Stations, one Ascom d62 Wireless IP-DECT Handset and one Ascom d41 Wireless IP-DECT Handset. One computer is present in the network providing network services such as DHCP, TFTP and HTTP.

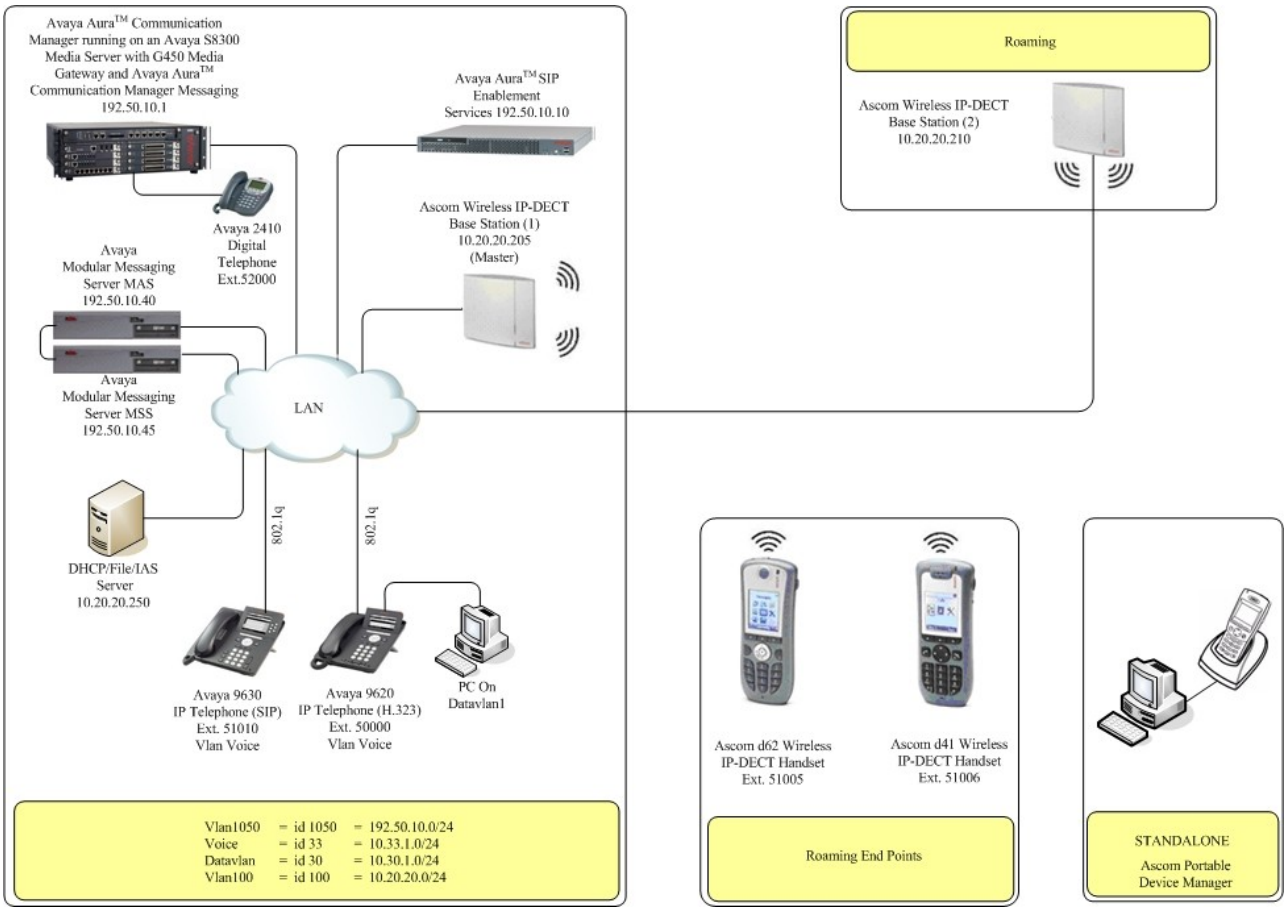
Avaya Aura™ Communication Manager running on an Avaya S8300 Media Server with G450 Media Gateway and Avaya Aura™ Communication Manager Messaging 192.50.10.1
Avaya Aura™ SIP Enablement Services 192.50.10.10
Avaya 2410 Digital Telephone Ext.52000
Ascom Wireless IP-DECT Base Station (1) 10.20.20.205 (Master)
Avaya Modular Messaging Server MAS 192.50.10.40
Avaya Modular Messaging Server MSS 192.50.10.45
LAN
802.1q
802.1q
DHCP/File/IAS Server 10.20.20.250
Avaya 9630 IP Telephone (SIP) Ext. 51010 Vlan Voice
Avaya 9620 IP Telephone (H.323) Ext. 50000 Vlan Voice
PC On Datavlan1
Vlan1050 = id 1050 = 192.50.10.0/24
Voice = id 33 = 10.33.1.0/24
Datavlan = id 30 = 10.30.1.0/24
Vlan100 = id 100 = 10.20.20.0/24
Roaming
Ascom Wireless IP-DECT Base Station (2) 10.20.20.210
Ascom d62 Wireless IP-DECT Handset Ext. 51005
Ascom d41 Wireless IP-DECT Handset Ext. 51006
Roaming End Points
STANDALONE
Ascom Portable Device Manager

Figure 1: Sample Network Diagram

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3. Equipment and Software Validated

The following equipment and software were used for the sample configuration provided:

Equipment	Software/Firmware
Avaya PBX Products	
Avaya S8300 Server running Avaya Aura™ Communication Manager	Avaya Aura™ Communication Manager 5.2
Avaya G450 Media Gateway (Corporate Site) MGP MM712 DCP Media Module	 28.22.0 HW9
Avaya Aura™ SIP Enablement Services	
Avaya Aura™ SIP Enablement Services	5.2 SP2
Avaya Messaging (Voice Mail) Products	
Avaya Modular Messaging - Messaging Application Server (MAS)	5.0
Avaya Modular Messaging - Message Storage Server (MSS)	5.0
Avaya Communication Manager Messaging (CMM)	5.2.1-13.0
Avaya Telephony Sets	
Avaya 9600 Series IP Telephones	Avaya one-X Deskphone Edition 3.0.1
Avaya 9600 Series IP Telephones	Avaya one-X Deskphone SIP 2.4
Avaya 2410 Digital Telephone	5.0
Ascom Products	
Ascom Wireless IP-DECT Base Station	IPBS(3.2.2)
Ascom d62 Wireless IP-DECT Handset	2.8.22
Ascom d41 Wireless IP-DECT Handset	2.8.22
Ascom Device Manger (WinPDM)	3.3.5
MS Products	
DHCP / File / IAS server	Microsoft Windows 2003 Server

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4. Configure Avaya Aura™ Telephony Infrastructure

This section describes the steps required for configuring Avaya Aura™ Telephony Infrastructure to support the sample network shown in **Figure 1**. The assumption is that the appropriate license and authentication files have been installed on the servers and that login and password credentials are available. It is also assumed that the standard configurations on Avaya Aura™ Communication Manager and Avaya Aura™ SIP Enabled Services have been executed to support telephony using various types of Avaya phone sets. Refer to **[1]**, **[2]** and **[3]** for more information.

Each Ascom Wireless IP-DECT Handset configured in the sample network in **Figure 1** was administered as OPS stations (Off-PBX Stations) on Avaya Aura™ Communication Manager. For information on how to administer these types of stations refer to **[1]**, **[2]**, and **[3]**.

Step	Description
1.	To enable the features used for testing (Call Park, Call Park Answerback, Call Forwarding and Call Pickup) administer the configuration for Feature-Access-Codes (FAC) on Communication Manager. From the SAT (System Administration Terminal) interface on Communication Manager, use the "**change feature-access-codes**" command to configure the following parameters on Page 1 and Submit the changes.

```
change feature-access-codes                                    Page   1 of   9
                              FEATURE ACCESS CODE (FAC)
         Abbreviated Dialing List1 Access Code: *600
         Abbreviated Dialing List2 Access Code: *601
         Abbreviated Dialing List3 Access Code: *602
Abbreviated Dial - Prgm Group List Access Code:
                      Announcement Access Code: *604
                       Answer Back Access Code: *650
                         Attendant Access Code:
      Auto Alternate Routing (AAR) Access Code: 3
    Auto Route Selection (ARS) - Access Code 1: 9     Access Code 2:
                 Automatic Callback Activation: *605   Deactivation: *606
Call Forwarding Activation Busy/DA: *607   All: *608   Deactivation: *609
   Call Forwarding Enhanced Status:        Act:        Deactivation:
                         Call Park Access Code: *652
                       Call Pickup Access Code: #6
CAS Remote Hold/Answer Hold-Unhold Access Code:
                  CDR Account Code Access Code:
                        Change COR Access Code:
                   Change Coverage Access Code:
            Conditional Call Extend Activation:        Deactivation:
                   Contact Closure   Open Code:          Close Code:
 ESC-x=Cancel Esc-e=Submit Esc-p=Prev Pg Esc-n=Next Pg Esc-h=Help
```


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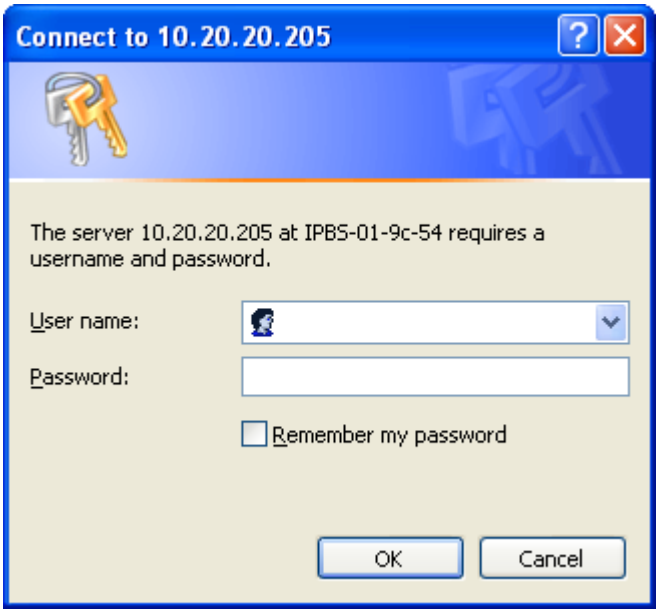
5. Configure Ascom wireless IP-DECT SIP Solution

The following steps detail the initial configuration for the Ascom Wireless IP-DECT SIP Solution. Log onto the Ascom wireless IP-DECT Base Station via a web browser using the following URL format: http://IPBS-XX-XX-XX, where XX-XX-XX are the last 3 bytes of the MAC address of the Ascom wireless IP-DECT Base Station. For example, an Ascom wireless IP-DECT Base Station with a MAC address of 00-01-3E-00-CB-DB could be accessed using http://IPBS-00-CB-DB or via the Base Station IP address assigned by DHCP server.

5.1. Configure IP-DECT Base Station

The Ascom wireless IP-DECT Base Stations can be configured in a Master/Standby Master scenario to provide redundancy or to extend the radius of coverage (roaming). The following configuration steps detail the configuration process used to configure an Ascom wireless IP-DECT Base Station in Master mode only.

Roaming between multiple Ascom Wireless IP-DECT Base Stations as shown in Figure 1 was tested but the configuration setup will not be shown in this document. Refer to [**7**] for information on how to configure roaming.

Step	Description
1.	Launch a web browser and enter either the IP address, (obtained from the DHCP server) or http://IPBS-XX-XX-XX as shown in **Section 5** into the URL. The user will be presented with a login screen. Refer to [**7**] for appropriate credentials needed to access the Ascom wireless IP-DECT Base Station. Enter the appropriate login information and then click **OK**. 

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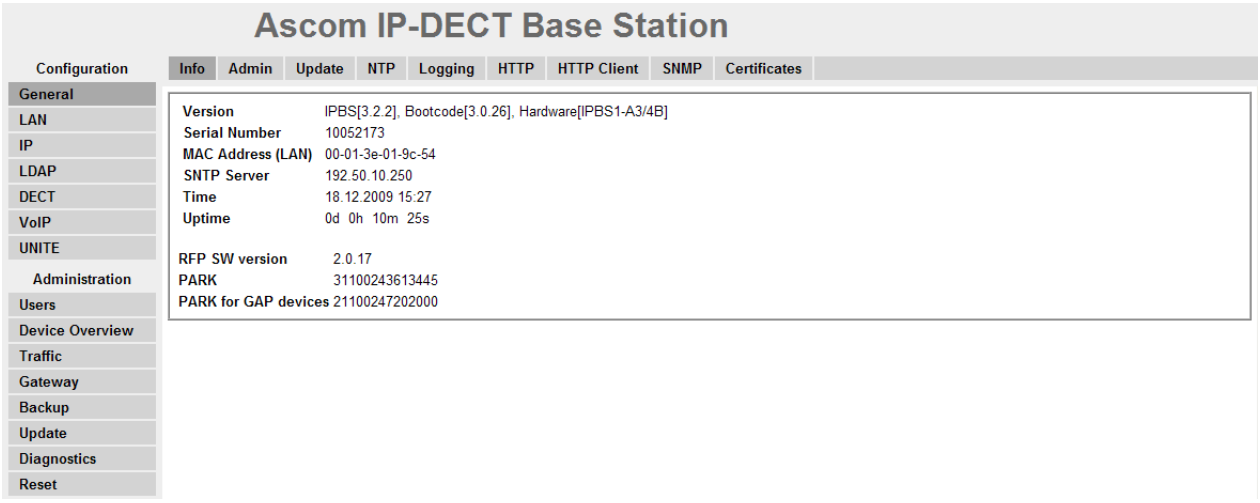
Step	Description
2.	The user is presented with the **General Info** frame where the system information for the Ascom wireless IP-DECT Base Station is displayed. 

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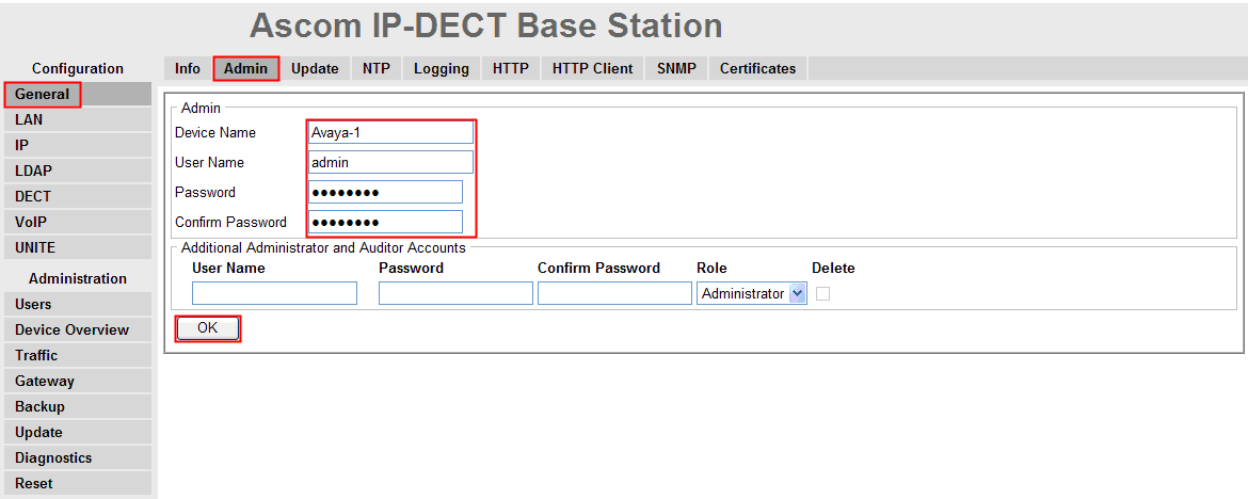
Step	Description
3.	The web interface on the Ascom wireless IP-DECT Base Station consists of a series of frames selected by a two-click process, where a category and then an option are clicked. Categories are found below **Configuration**, which is displayed in the top left portion of the frame, and options are found to the right. Navigate to the **General Admin** frame by clicking **General** and then clicking **Admin**. Configure the fields displayed below and then click **OK**. The **Device Name** can be any descriptive name that identifies this Ascom wireless IP-DECT Base Station. In the sample network the name "Avaya-1" was chosen. The **User Name** and **Password** fields were populated using the default credentials. The box below **Password** is to confirm the password and the value entered for the **Password** field must be entered here. Click **OK** to continue. 

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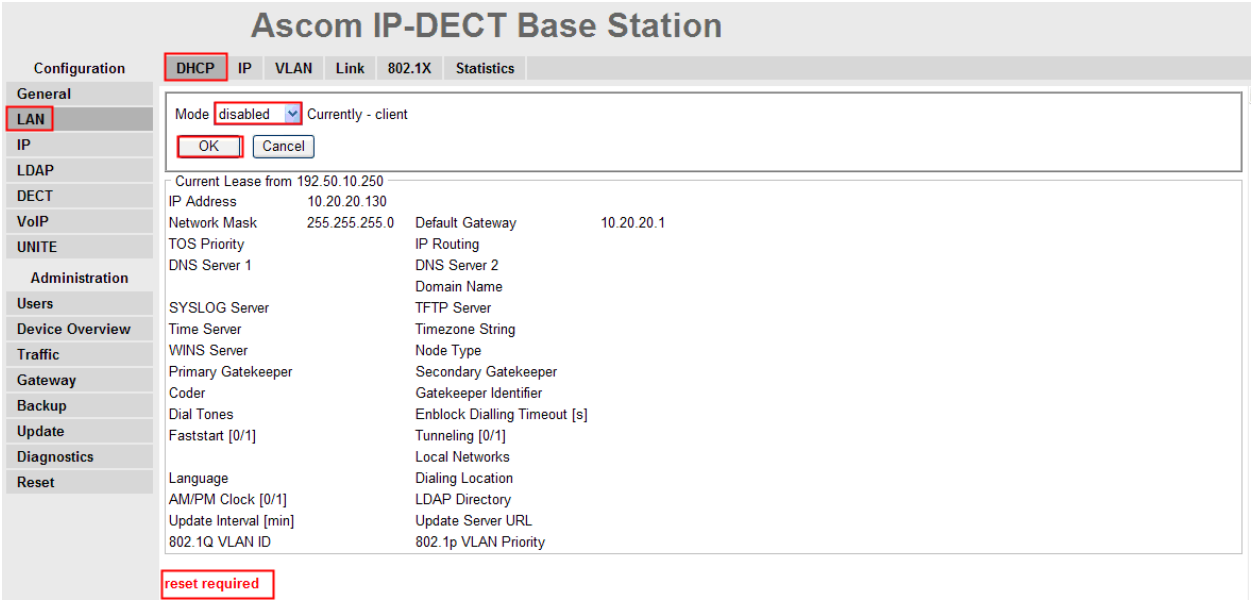
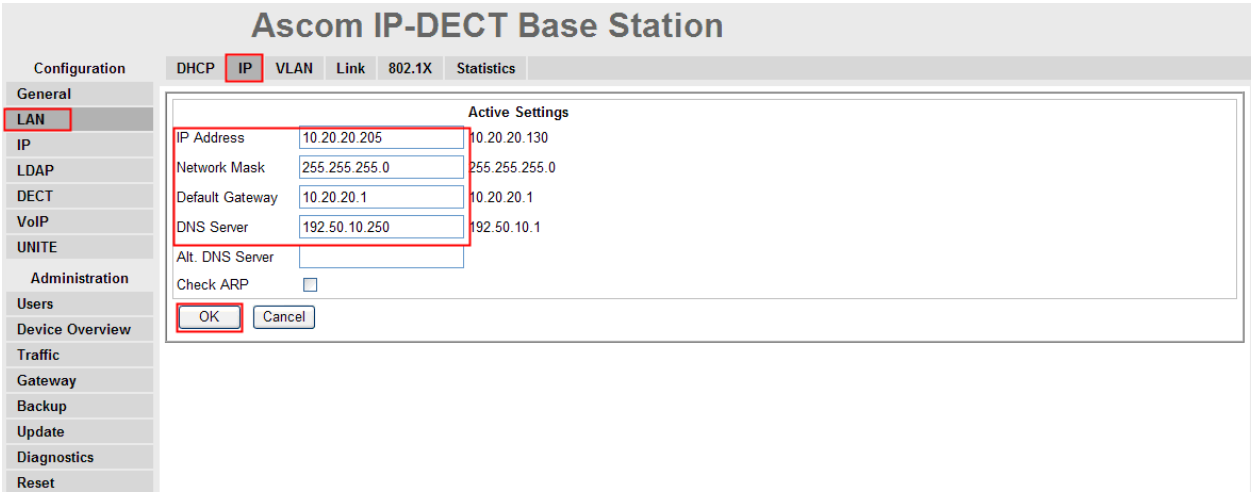
Step	Description
4.	Navigate to the **LAN DHCP** frame by first clicking **LAN** and then clicking **DHCP**. Using the drop-down list, set **Mode** to "disabled" and then click **OK**. This will present the user with the clickable red text which reads "reset required". Click **IP** tab to continue to the **LAN IP** frame**.** 
5.	Set the static **IP Address**, **Network Mask**, **Default Gateway** and **DNS Server**, and click **OK.** Click **VLAN** to continue. 

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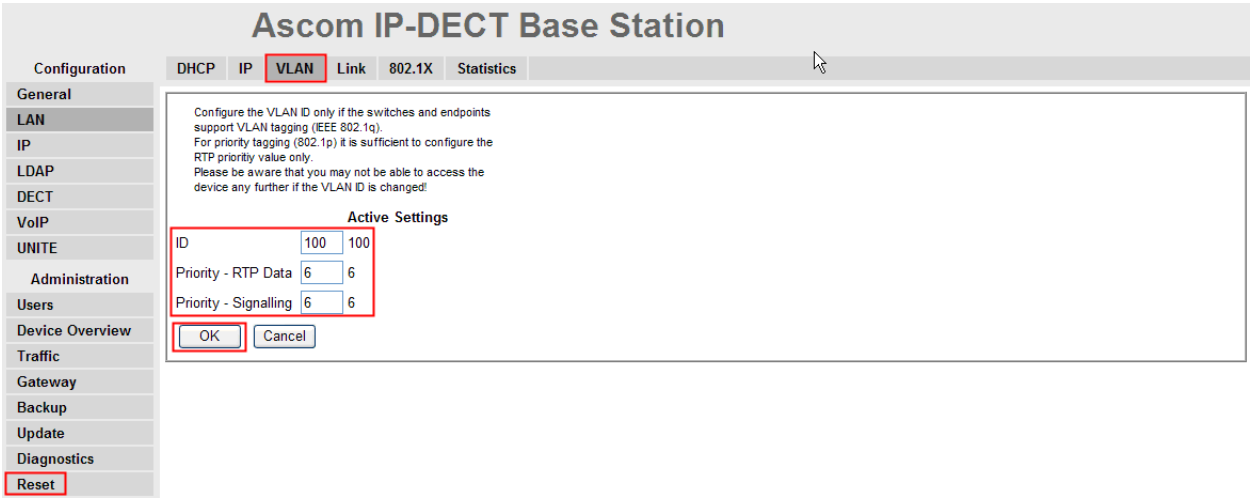
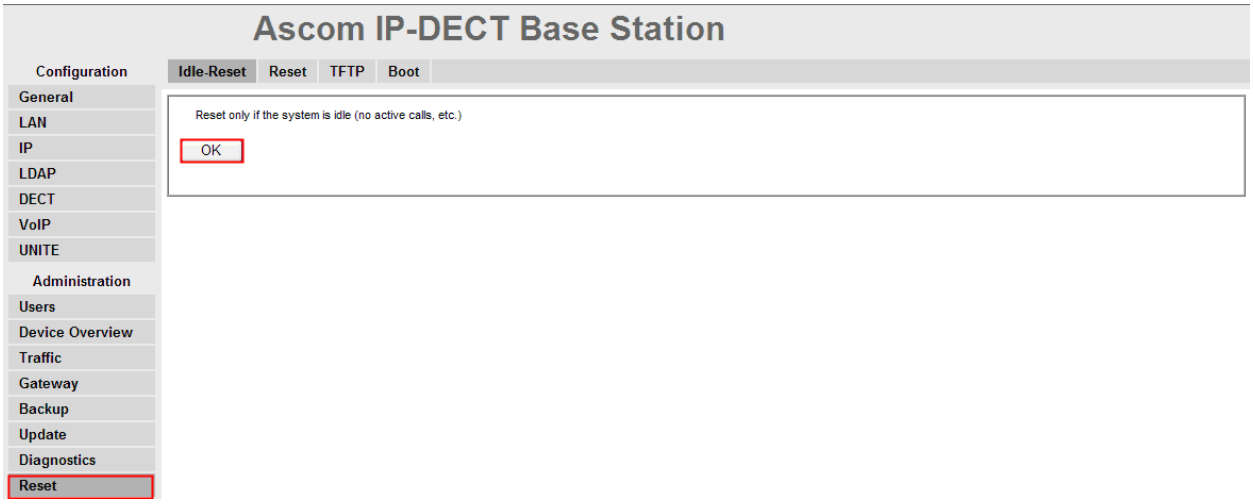
Step	Description
6.	Set the **ID, Priority – RTP Data** and **Priority – Signalling**, and click **OK.** Click **Reset** to continue. 
7.	Click **OK** to initiate the system reset. Many of the other changes made to the system during the configuration process require a reboot. **Repeat this process whenever a reset is required**. 

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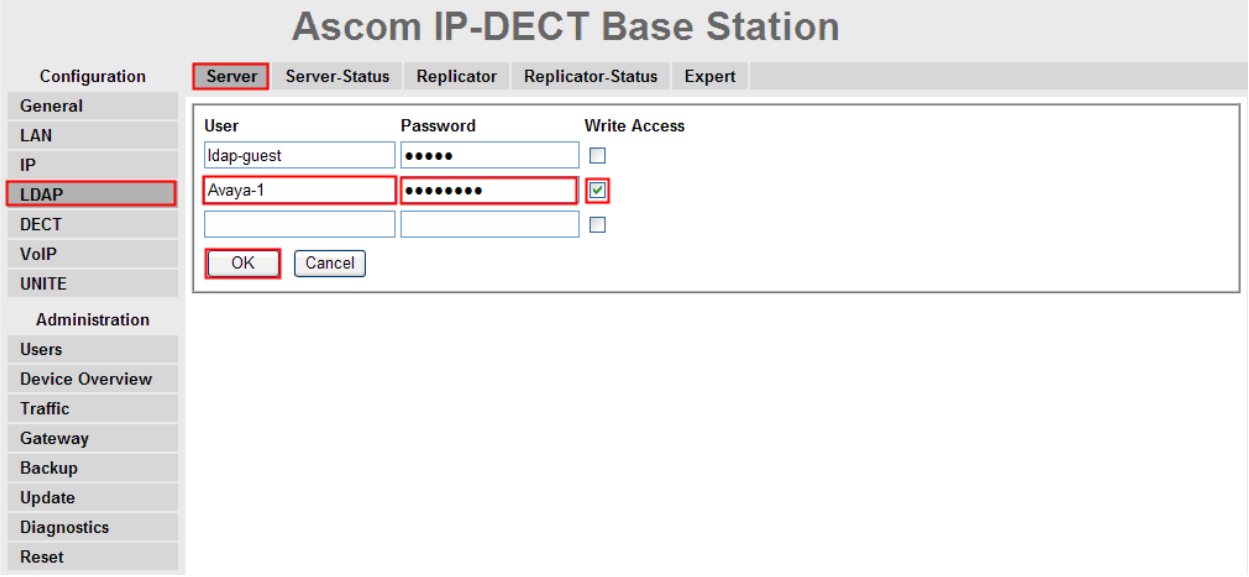
Step	Description
8.	After the Ascom wireless IP-DECT Base Station (**Avaya-1**) has rebooted, navigate to the **LDAP Server** frame by clicking **LDAP** and then clicking **Server**. The "ldap-guest" account is a default system account. Configure **User** using the **Device Name** used in **Step 3**. Configure the **Password** field with the **Password** used in **Step 3.** Check the **Write Access** check box for the "Avaya-1" user account and then click **OK** to continue. 

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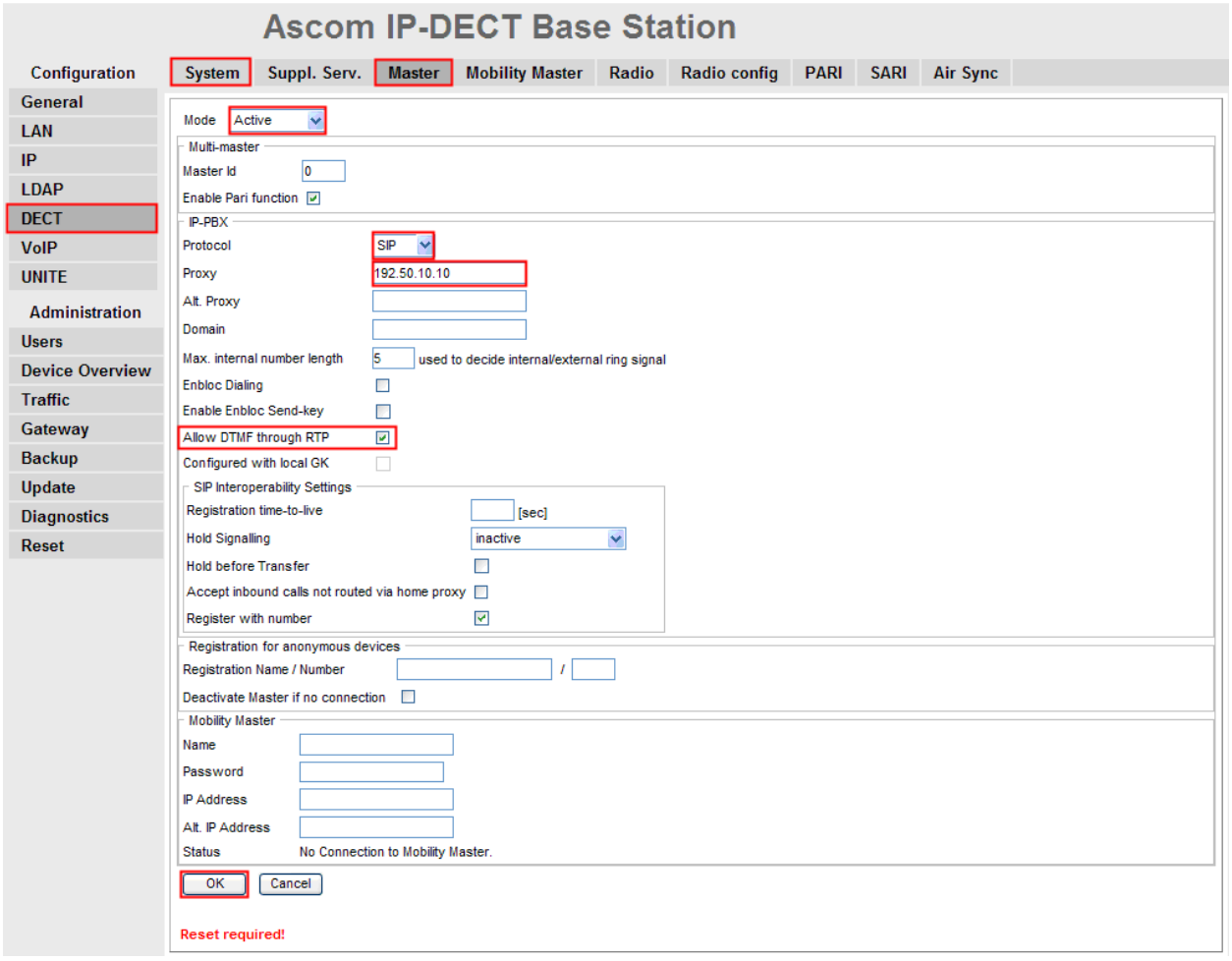
Step	Description
9.	Navigate to the **DECT Master** frame by clicking **DECT** and then clicking **Master**. Configure the fields displayed below and then click **OK**. Use the drop-down list for **Mode** and select "Active". Under **IP-PBX**, use the drop-down list for **Protocol** and select "SIP". Set **Proxy** to the IP address of the SIP Enablement Services (see **Figure 1**). Check the **Allow DTMF through RTP** check box. Click **OK.** Click **System** to continue.



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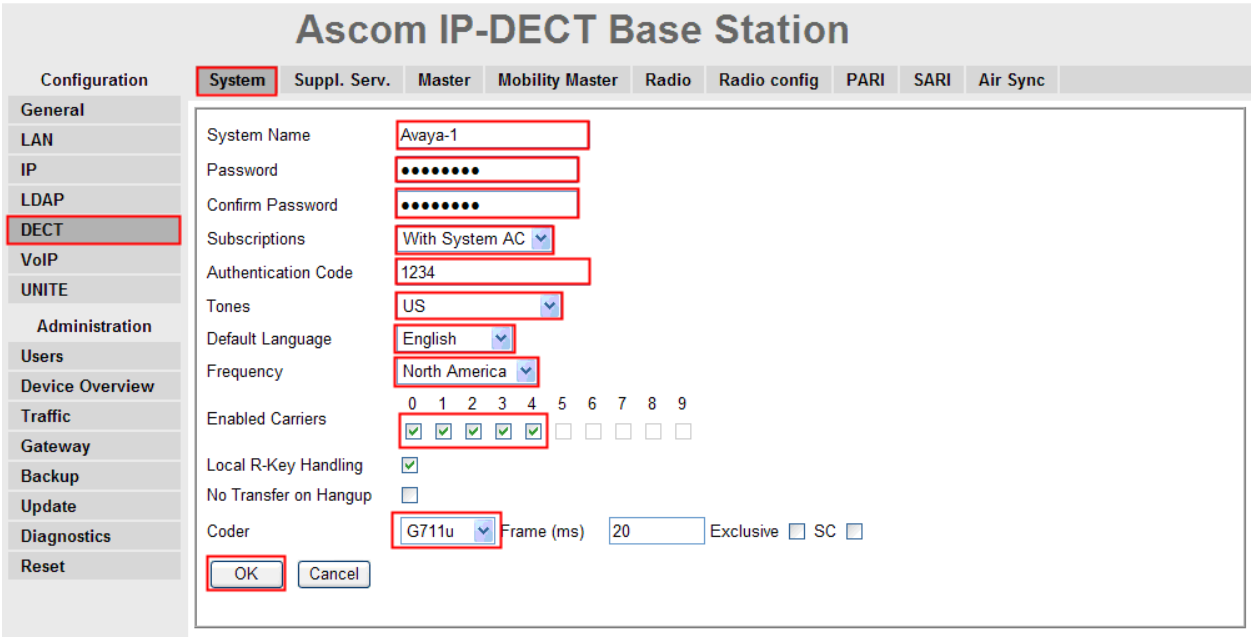
Step	Description
10.	Navigate to the **DECT System** frame by clicking **DECT** and then clicking **System**. Configure the fields displayed below and then click **OK**. **System Name** is the **Device Name** used in **Step 3**. **Password** is the Password used in **Step 3**. The box below **Password** is to confirm the password and the value configured for **Password** field must be entered here. The **Authentication Code** is a numerical code that every DECT handset will need to use to subscribe to this system. Using the drop-down list, **Subscriptions** can be set to "With User AC", "With System AC", or "Disable". In the sample configuration "With System AC" was used. This enables the system to use the **Authentication Code** when challenging DECT handsets during registration. Use the drop-down list for **Tones** and select "US". Use the drop-down list for **Default Language** and select "English". Use the drop-down list for **Frequency** and select "North America". Check the **0**,**1**,**2**,**3** and **4** check boxes. The **Enabled Carriers** check boxes enable the DECT handsets to use different channels or frequencies when transmitting. Use the drop-down list for **Coder** and select "**G711u**". Ensure that the codec chosen matches the codec configured on the Communication Manager. Note: The G.729AB codec was tested and is configured the same way. 

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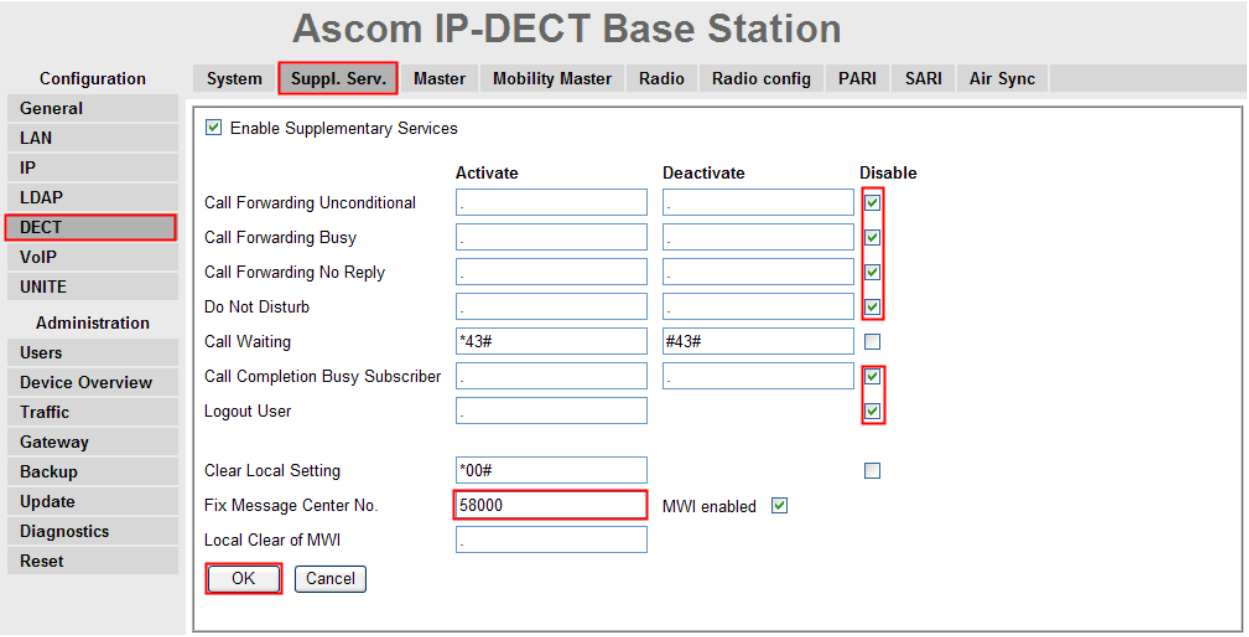
Step	Description
11.	Navigate to the **DECT Suppl. Serv.** frame by clicking **DECT** and then clicking **Suppl. Serv.**. Check the **Enable Supplementary Services** check box. For the compliance testing, the Avaya PBX handled most of the features listed, so these functions were disabled on the Ascom BaseStation. Disable the following, **Call Forwarding Unconditional, Call Forwarding Busy, Call Forwarding No Reply, Do not Disturb, Call Completion Busy Subscriber** and **Logout User.** Depending on which Voicemail system is being used, enter the extension used for Avaya Modular Messaging or Avaya Communication Manager Messaging in the **Fix Message Center No.** field, and check the **MWI enabled** check box. Click **OK** to continue. 

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Step	Description
12.	Navigate to the **DECT PARI** frame by clicking **DECT** and then clicking **PARI**. PARI is a user-defined system value and must range from 1-35. Enter any number from 1-35. Click **OK** to continue.
13.	Navigate to the **DECT SARI** frame by clicking **DECT** and then clicking **SARI**. **SARI** is an Ascom provided activation code which is needed for the system to function. Contact Ascom to obtain a **SARI**. Enter the **SARI** value. Click **OK** to continue.

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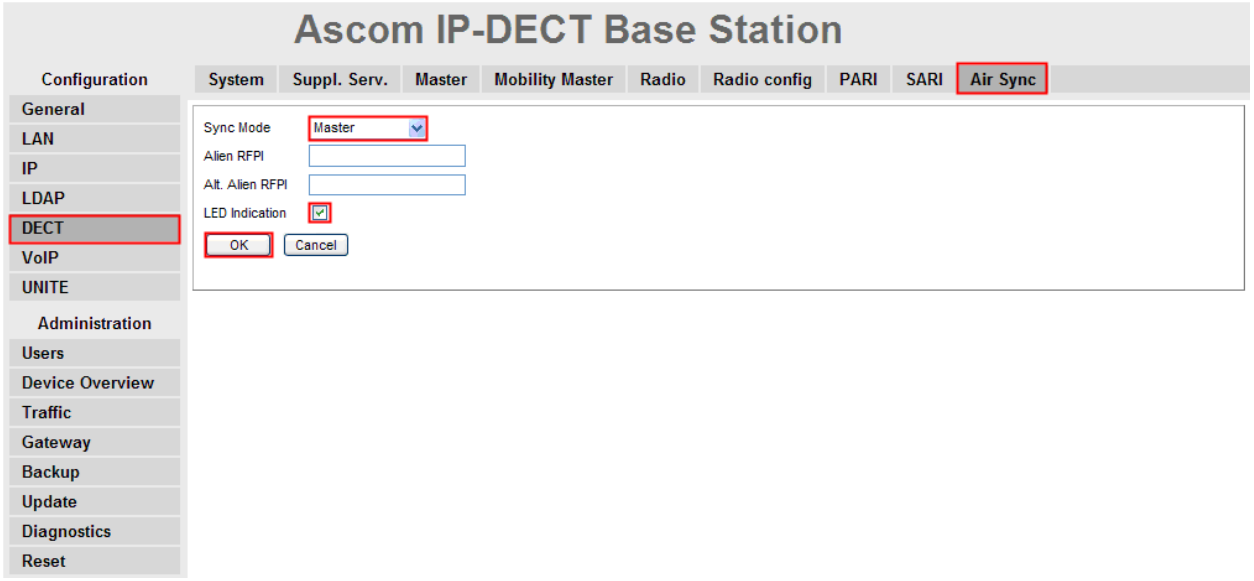
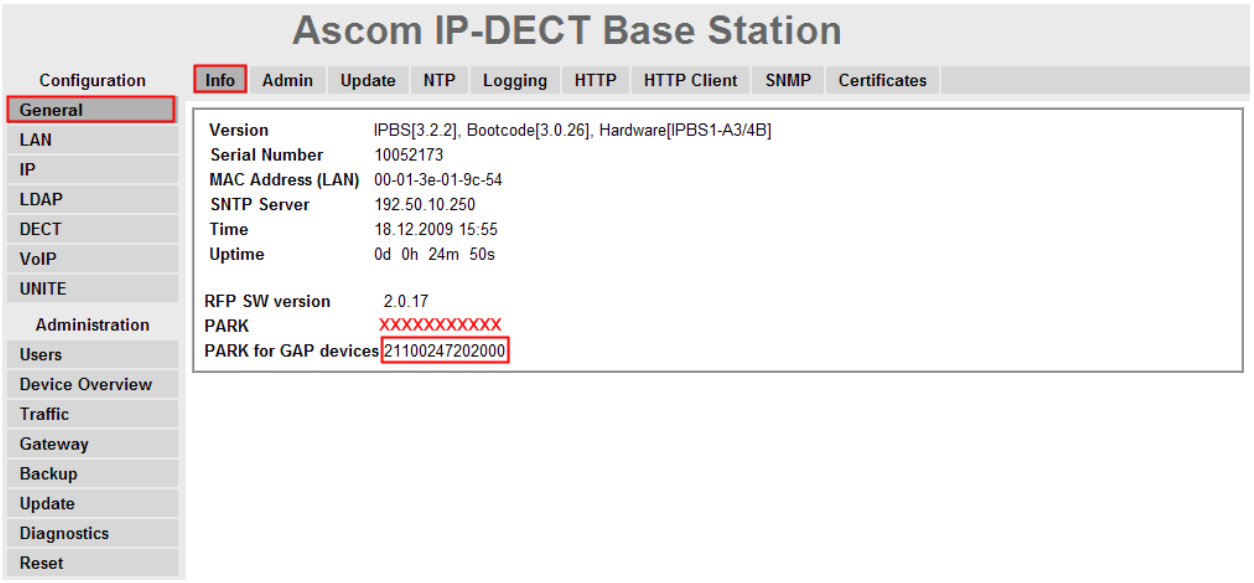
Step	Description
14.	Navigate to the **DECT Air Sync** frame by clicking **DECT** and then clicking **Air Sync**. Use the drop-down list for **Sync Mode** and select "Master". Check the **LED Indication** check box. Click **OK** to continue. 
15.	Navigate to the **General Info** frame by clicking **General** and then clicking **Info**. The **PARK for GAP devices** is displayed. This value is needed when programming Ascom wireless DECT handsets. The **PARK for GAP devices** is similar to an SSID in an 802.11 wireless environment. 

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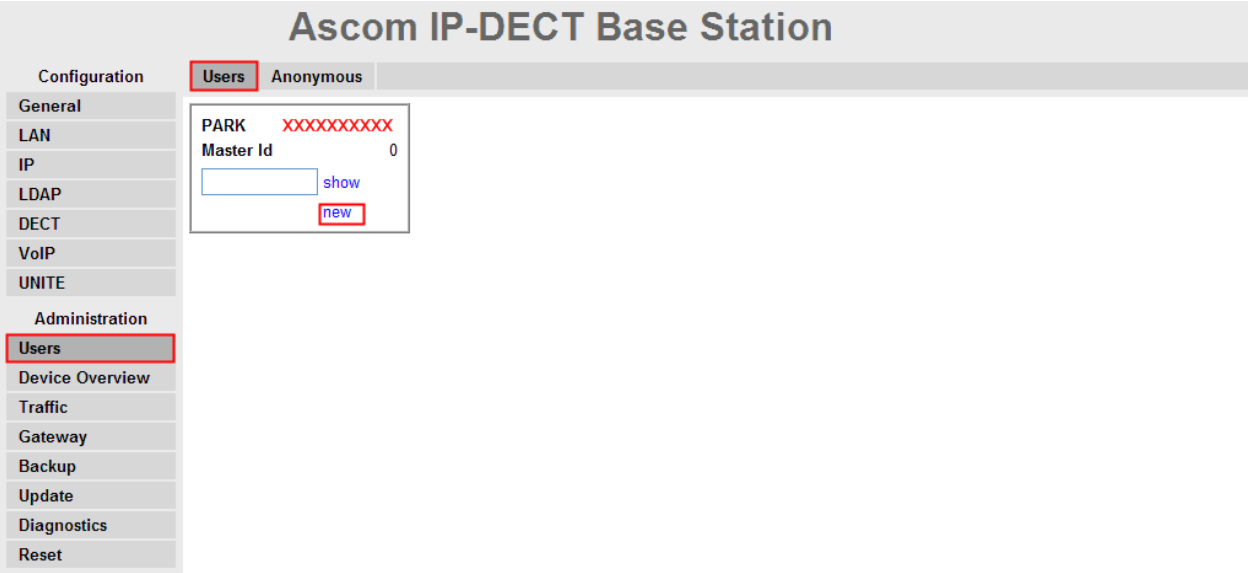
Step	Description
16.	Navigate to the **Users** frame by clicking **Users** and then clicking **Users**. Click **new** to provision a new user account. 

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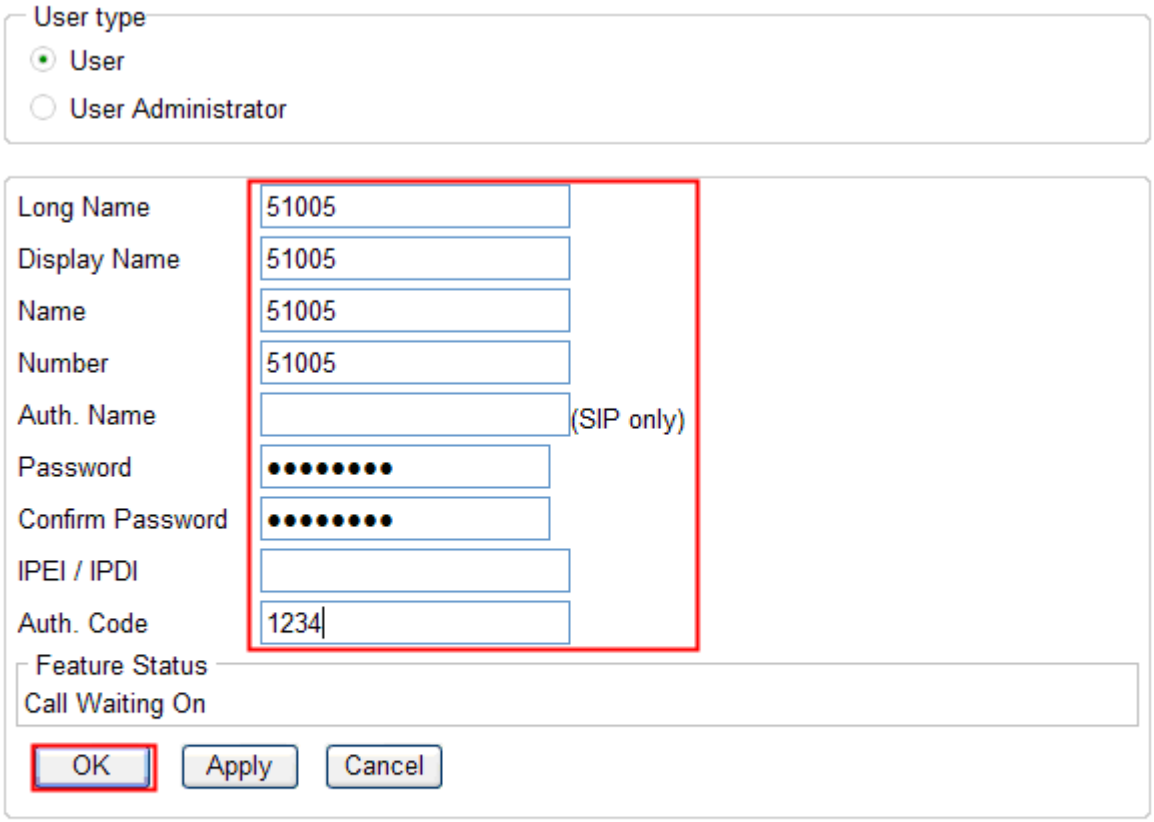
Step	Description
17.	The **Edit User** web page is presented. **Long Name** can be any descriptive name that identifies this user. **Display Name** is the text string that will be displayed on the LCD screen of the Ascom wireless DECT Handset. The **Name** & **Number** fields are the extension assigned to this user. The **Password** field is the password used to register with the SIP Enablement Services. The box below **Password** is to confirm the password and the value entered for the **Password** field must be entered here. **Auth. Code** is used only if **Subscriptions** in **Step 10** is set to "With User AC". Once all the user information has been configured, click **OK**. Repeat this process for each user being added to the system. 

5.2. Configure Ascom wireless DECT Handset

Refer to **[8], [9]**, **[10]** and **[11]** to obtain information on the procedures for subscribing and registering the Ascom wireless DECT Handsets to the Ascom wireless IP-DECT Base Station.

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6. General Test Approach and Test Results

6.1. General Test Approach

All feature functionality test cases were performed manually. The general test approach entailed verifying the following:

- Registration, re-registration of Ascom wireless DECT Handsets with Avaya Aura™ SIP Enablement Services.
- Verify G.711MU and G.729AB codecs, shuffling, conferencing, Message Waiting Indicator and message retrieval from Avaya Modular Messaging Server & Avaya Communication Manager Messaging.
- Inter-office VoIP calls between Ascom wireless DECT Handsets and Avaya SIP & H.323 IP Telephones and Avaya Digital Telephones.
- Roam between multiple Ascom wireless IP-DECT Base Stations using the Ascom wireless DECT Handsets.

6.2. Test Results

The Ascom wireless DECT Handsets passed all test cases. Ascom wireless DECT Handsets were verified to successfully register with Avaya Aura™ SIP Enablement Services. Two codecs were used for testing: G.711MU and G.729AB. Telephone calls were verified to operate correctly with the media path direct between the telephones (shuffling enabled) and with the media path centralized through Avaya Aura™ Communication Manager (shuffling disabled). Calls were maintained for durations over one minute without degradation to voice quality. The telephony features verified to operate correctly included transfer (attended and unattended), hold/return from hold, multiple call appearances, caller ID operation, call forwarding, call park & call pickup, bridged appearance alerting, Avaya Modular Messaging & Avaya Communication Manager Messaging voicemail and MWI.

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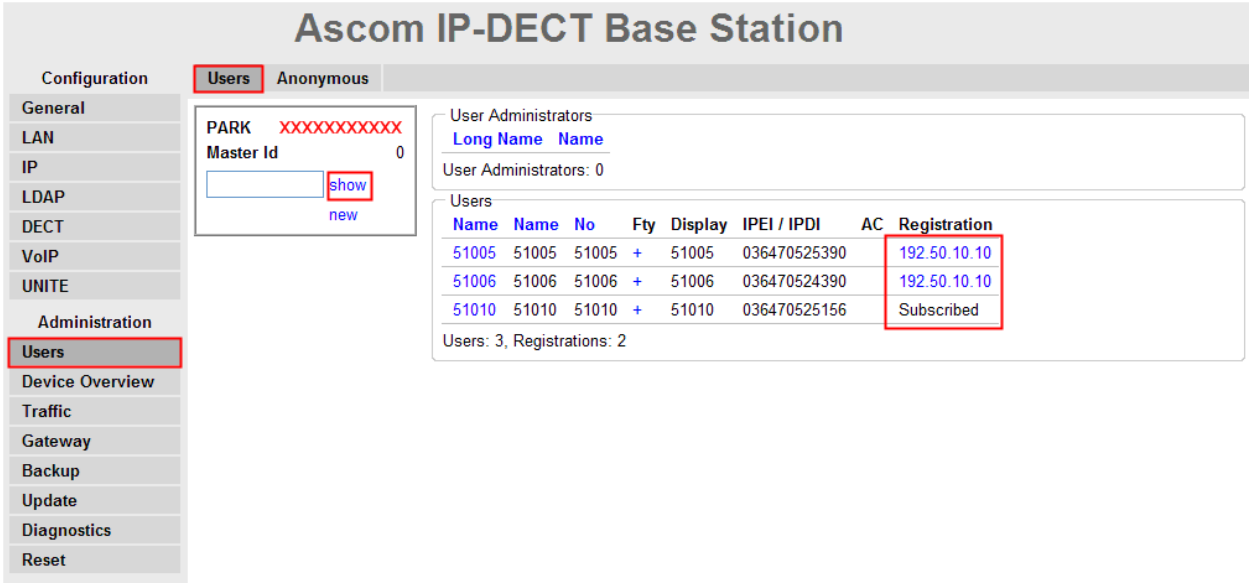
7. Verification Steps

7.1. Ascom wireless DECT Handset Registration Verification

The following steps can be used to ascertain the registration state of the Ascom wireless DECT Handsets that the Ascom wireless IP-DECT Base Station is configured to support.

From a web browser, open a connection to the Ascom wireless IP-DECT Master Base Station (see **Section 5.1 Step 1)**. Navigate to the **Users** frame by clicking **Users**, then clicking **Users**, and then clicking **show**. A **Registration** state of "Pending"(Not Shown) indicates an Ascom wireless DECT Handset has not registered to the Ascom wireless IP-DECT Base Station. A **Registration** state of "Subscribed" indicates that an Ascom wireless DECT Handset has connected to the Ascom wireless IP-DECT Base Station and requested the use of that particular extension. A **Registration** state that displays the IP Address of the Avaya Aura™ SIP Enablement Services indicates the extension has successfully registered to both the Ascom wireless IP-DECT Base Station and Avaya Aura™ SIP Enablement Services.



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7.2. Ascom wireless DECT Handset Function Verification

The following steps can be used to verify proper operation of the Ascom wireless DECT Handsets.

- Place calls from the Ascom wireless DECT Handsets and verify two-way audio.
- Place a call to the Ascom wireless DECT Handsets, allow the call to be directed to voicemail, leave a voicemail message and verify the MWI message is received.
- Using each Ascom wireless DECT Handset that received a voicemail, connect to the voicemail system to retrieve the voicemail and verify the MWI clears.
- Place calls to the Ascom wireless DECT Handsets and exercise calling features such as transfer and hold.
- The specific calling features that were verified to operate correctly include transfer (attended and unattended), hold/return from hold, multiple call appearances, caller ID operation, call forwarding, call park & pickup, bridged appearance alerting, and voicemail Message Waiting Indicator (MWI).

8. Conclusion

These Application Notes illustrate the procedures necessary for configuring the Ascom wireless IP-DECT SIP Solution comprised of the Ascom wireless IP-DECT Base Station and Ascom wireless DECT Handsets with an Avaya Aura™ Telephony Infrastructure consisting of Avaya Aura™ Communication Manager, Avaya Aura™ SIP Enablement Services, Avaya Modular Messaging and Avaya Communication Manager Messaging in a converged Voice over IP and Data Network. All feature functionality test cases described in **Section 6.1** passed.

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9. Additional References

Avaya documentation was obtained from http://support.avaya.com.

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Ascom product documentation.

[8] Ascom product documentation can be found at http://www.Ascomwireless.com

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